

WHAT IS CLAIMED IS:

1. A chemical-mechanical polishing composition comprising:
 - (a) an abrasive comprising α -alumina,
 - (b) about 0.05 to about 50 mmol/kg of ions of at least one metal selected from the group consisting of calcium, strontium, barium, and mixtures thereof, based on the total weight of the polishing composition, and
 - (c) a liquid carrier comprising water.
2. The chemical-mechanical polishing composition of claim 1, wherein the ions of the metal are present in an amount of about 0.05 to about 10 mmol/kg.
3. The chemical-mechanical polishing composition of claim 2, wherein the ions of the metal are present in an amount of about 0.05 to about 5 mmol/kg.
4. The chemical-mechanical polishing composition of claim 1, wherein the abrasive further comprises fumed alumina.
5. The chemical-mechanical polishing composition of claim 4, wherein the abrasive comprises about 10 wt.% or more α -alumina.
6. The chemical-mechanical polishing composition of claim 1, wherein the abrasive is present in the polishing composition in an amount of about 0.1 to about 10 wt.% based on the total weight of the polishing composition.
7. The chemical-mechanical polishing composition of claim 6, wherein the abrasive is present in the polishing composition in an amount of about 1 to about 5 wt.% based on the total weight of the polishing composition.
8. The chemical-mechanical polishing composition of claim 1, wherein the polishing composition has a pH of about 1 to about 7.
9. The chemical-mechanical polishing composition of claim 8, wherein the polishing composition has a pH of about 2 to about 5.
10. A chemical-mechanical polishing composition comprising:

- (a) an abrasive selected from the group consisting of α -alumina, γ -alumina, δ -alumina, θ -alumina, diamond, boron carbide, silicon carbide, tungsten carbide, titanium nitride, and mixtures thereof,
- (b) about 0.05 to about 3.5 mmol/kg of ions of at least one metal selected from the group consisting of calcium, strontium, barium, magnesium, zinc, and mixtures thereof, based on the total weight of the polishing composition, and
- (c) a liquid carrier comprising water.

11. The chemical-mechanical polishing composition of claim 10, wherein the abrasive further comprises fumed alumina.

12. The chemical-mechanical polishing composition of claim 11, wherein the abrasive comprises about 10 wt.% or more α -alumina.

13. The chemical-mechanical polishing composition of claim 10, wherein the abrasive is present in the polishing composition in an amount of about 0.1 to about 10 wt.% based on the total weight of the polishing composition.

14. The chemical-mechanical polishing composition of claim 13, wherein the abrasive is present in the polishing composition in an amount of about 1 to about 5 wt.% based on the total weight of the polishing composition.

15. The chemical-mechanical polishing composition of claim 10, wherein the polishing composition has a pH of about 1 to about 7.

16. The chemical-mechanical polishing composition of claim 15, wherein the polishing composition has a pH of about 2 to about 5.

17. A method of polishing a substrate comprising the steps of:

- (a) providing a substrate,
- (b) providing a chemical-mechanical polishing composition comprising:
 - (i) an abrasive comprising α -alumina,
 - (ii) about 0.05 to about 50 mmol/kg of ions of at least one metal selected from the group consisting of calcium, strontium, barium, and mixtures thereof, based on the total weight of the polishing composition, and
 - (iii) a liquid carrier comprising water,

(c) applying the chemical-mechanical polishing composition to at least a portion of the substrate, and

(d) abrading at least a portion of the substrate with the polishing composition to polish the substrate.

18. The method of claim 17, wherein the ions of the metal are present in the chemical-mechanical polishing composition in an amount of about 0.05 to about 10 mmol/kg.

19. The method of claim 18, wherein the ions of the metal are present in the chemical-mechanical polishing composition in an amount of about 0.05 to about 5 mmol/kg.

20. The method of claim 17, wherein the substrate comprises a noble metal selected from the group consisting of platinum, iridium, ruthenium, rhodium, palladium, silver, osmium, gold, and combinations thereof, and at least a portion of the noble metal is abraded with the polishing composition to polish the substrate.

21. The method of claim 20, wherein the substrate comprises platinum, and at least a portion of the platinum is abraded with the polishing composition to polish the substrate.

22. The method of claim 17, wherein the abrasive further comprises fumed alumina.

23. The method of claim 22, wherein the abrasive comprises about 10 wt.% or more α -alumina.

24. The method of claim 17, wherein the abrasive is present in the polishing composition in an amount of about 0.1 to about 10 wt.% based on the total weight of the polishing composition.

25. The method of claim 24, wherein the abrasive is present in the polishing composition in an amount of about 1 to about 5 wt.% based on the total weight of the polishing composition.

26. The method of claim 17, wherein the polishing composition has a pH of about 1 to about 7.

27. The method of claim 26, wherein the polishing composition has a pH of about 2 to about 5.

28. A method of polishing a substrate comprising the steps of:

(a) providing a substrate,

(b) providing a chemical-mechanical polishing composition comprising:

(i) an abrasive selected from the group consisting of α -alumina, γ -alumina, δ -alumina, θ -alumina, diamond, boron carbide, silicon carbide, tungsten carbide, titanium nitride, and mixtures thereof,

(ii) about 0.05 to about 3.5 mmol/kg of ions of at least one metal selected from the group consisting of calcium, strontium, barium, magnesium, zinc, and mixtures thereof, based on the total weight of the polishing composition, and

(iii) a liquid carrier comprising water,

(c) applying the chemical-mechanical polishing composition to at least a portion of the substrate, and

(d) abrading at least a portion of the substrate with the polishing composition to polish the substrate.

29. The method of claim 28, wherein the substrate comprises a noble metal selected from the group consisting of platinum, iridium, ruthenium, rhodium, palladium, silver, osmium, gold, and combinations thereof, and at least a portion of the noble metal is abraded with the polishing composition to polish the substrate.

30. The method of claim 29, wherein the substrate comprises platinum, and at least a portion of the platinum is abraded with the polishing composition to polish the substrate.

31. The method of claim 28, wherein the abrasive further comprises fumed alumina.

32. The method of claim 31, wherein the abrasive comprises about 10 wt.% or more α -alumina.

33. The method of claim 28, wherein the abrasive is present in the polishing composition in an amount of about 0.1 to about 10 wt.% based on the total weight of the polishing composition.

34. The method of claim 33, wherein the abrasive is present in the polishing composition in an amount of about 1 to about 5 wt.% based on the total weight of the polishing composition.

35. The method of claim 28, wherein the polishing composition has a pH of about 1 to about 7.

36. The method of claim 35, wherein the polishing composition has a pH of about 2 to about 5.